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Published in:
Medical Education

DOI:
[10.1111/medu.13099](https://doi.org/10.1111/medu.13099)

Publication date:
2016

Document Version
Peer reviewed version

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):

Schofield, S. J., & Schofield, P. G. (2016). What's in a name? Word inflation, punctuation, abbreviation and cloud formation. *Medical Education*, 50(12), 1264-1268. <https://doi.org/10.1111/medu.13099>

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What's in a name: Word inflation, punctuation, abbreviation and cloud formation

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Abstract

The title of a journal paper offers a crucial portal into any scientific field. It determines whether interested readers locate the paper and whether others have enough interest sparked to lead them to read the abstract. This article looks at authored journal paper titles in *Medical Education* over its first 50 years (n=6357) of publication and *Medical Teacher* over its first 35 years of publication, revealing both trends in areas of interest and how those interests are worded. Word clouds per decade showed a shift from teaching to learning and examination to assessment, and new foci on learning, patient, research and feedback in both journals. The average length of title in *Medical Education* peaked in the 2000s, dropping to 70 in the 2010s, with no titles being larger than 140 characters (the length of a tweet) in this last decade. Abbreviations were used sparingly. The use of humorous titles, although not common, has increased in recent years. The use of the colon showed a marked increase in the 80s, dropping a little in the 2000s but resurging in the 2010s. Titles posed as a question increased steadily, appearing to plateau in the 2000s at 11%. The use of humour and questions suggests that these journal article authors are considering papers to be selected by the human rather than just the virtual eye. We also hypothesise the use of humour may indicate a maturation of medical education as a subject.

Introduction

As Kevin Eva points out in *Enough rope to hang yourself: word limits in Medical Education*, "if the title doesn't capture attention, the abstract won't be read"^{1(p432)}. As a result, the titles of articles written in published papers offer an interesting and accessible window into how the field has changed over time. In this paper we look at some trends in paper titles in *Medical Education* and *Medical Teacher*, and what they might reveal about trends in medical education itself.

Method

We downloaded all *Medical Education* journal references from volumes 1 (1966) to 49(8), including supplements, into Excel via Endnote (n=6575). Introductions, duplicates and papers without author

names were removed, leaving n=6357. The number of characters and words per title and punctuation use were calculated within Excel. The titles were read through to identify potential areas of interest. Analysis and visualisation of specific word and word-stem counts were performed in the R statistical environment² using the text mining package tm³, and word clouds produced using the Wordcloud package⁴. ‘Medical’ overwhelmed all the word clouds, so was excluded and the package rerun. Plurals were singularised (e.g. grouping ‘students’ and ‘student’ together as ‘student’). All *Medical Teacher* references from its first volume in 1979 to November 2015 were downloaded from PubMed and word clouds were then processed by decade in the same manner from 1980 onwards (1979 was ignored, the data set being too small to make a meaningful word cloud).

Results and discussion

Length of title

For titles in *Medical Education*, the average character length steadily increased up to the 2000s, dropping back again in the 2010s (Table 1). At the time of writing, no title was longer than 140 characters in the 2010s, compared with 3% in the previous two decades. The authors speculated this may be due to the rise in popularity of Twitter to share article titles⁵. However, the majority of journals now use online submission with character-restricted boxes, and *Medical Education*’s current system limits to 90 characters which will of course have had an impact. It is not known how this limit was decided upon.

| | Total | Characters including spaces | | | | | Words | | | | |
|---------|------------------|-----------------------------|-----|-----|------|----|-------|-----|-----|------|-----|
| Decade | Number of titles | Mean | Min | Max | >140 | % | Mean | Min | Max | >12 | % |
| 60s | 183 | 52.4 | 10 | 165 | 1 | 1% | 7.3 | 1 | 24 | 14 | 8% |
| 70s | 586 | 65.8 | 10 | 183 | 10 | 2% | 9.3 | 1 | 27 | 119 | 20% |
| 80s | 711 | 72.4 | 13 | 211 | 6 | 1% | 9.9 | 2 | 27 | 162 | 23% |
| 90s | 959 | 74.2 | 9 | 241 | 29 | 3% | 10.1 | 1 | 33 | 233 | 24% |
| 2000s | 2548 | 76.6 | 8 | 224 | 76 | 3% | 10.4 | 1 | 31 | 777 | 30% |
| 2010s | 1371 | 70.5 | 12 | 138 | 0 | 0% | 9.4 | 2 | 21 | 192 | 14% |
| Overall | 6357 | 72.8 | 8 | 241 | 122 | 2% | 9.9 | 1 | 33 | 1497 | 24% |

Table 1: Title length

Number of words

Titles ranged from 1 word (e.g. *Cheating*⁶) to 33 (*The performance of foreign medical graduates on the National Board of Medical Examiners (NBME) standardized patient examination prototype: a collaborative study of the NBME and the Educational Commission for Foreign Medical Graduates*

(ECFMG)⁷. The average number of words in a title increased up to the 2000s, dropping back in the 2010s (Table 1). This indicates an increase in characters per word (7.1 in the '60s and '70s to 7.35 in the '80s to '00s to 7.5 in the '10s), perhaps indicating professionalisation of the subject. However analysis of titles from *Medical Teacher* did not show a clear increasing trend, so this may be journal-specific. Jamali & Nikzad⁸ found within biological sciences that journal papers with longer titles are downloaded slightly less often than those with shorter titles. Bem⁹ considered the ideal length to be between 10 and 12 words, and APA¹⁰ recommended 12 maximum. We found the numbers of titles exceeding 12 words declined noticeably in the 2010s.

Trends in abbreviations

Hartley¹¹ warns against using acronyms in the title without spelling them out, so those used alone generally reveal acronyms that reside in a community's or society's commonly understood lexicon (e.g. MD and DVD). Abbreviations not spelled out in the title were used in 3% of *Medical Education* papers, with no noticeable shift in pattern. Use of some acronyms changed over time. For example, OSCE was first published in 1979 with its full name spelled out and appeared many times in subsequent years, but was first used in a title in its abbreviated form in 1991. That said, many authors continued to use non-abbreviated forms even after the first appearance of the shortened form (e.g. Objective Structured Clinical Examination was still used in full in 2014¹²). AIDS made its first appearance, unexpanded from the start, in 1988 and HIV 1991, an example of medical education responding to health trends. The term AIDS, however, first appeared in the medical literature 1982, the first clinical cases having been identified in 1981¹³. We leave it to the reader to decide whether the seven-year lag was a reasonable time for the topic to become of sufficient interest to medical educators, and to future researchers to investigate the link between health demands and topics published.

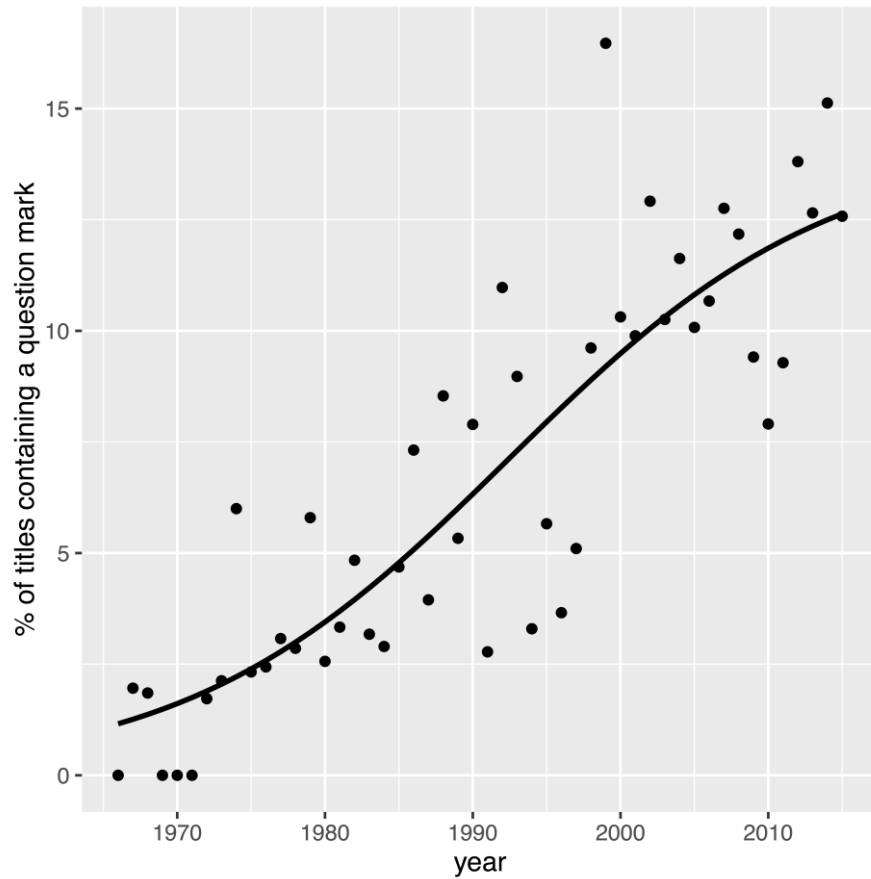


Figure 1: Growth in use of the question mark with solid line showing fitted logistic growth curve

Trends in punctuation

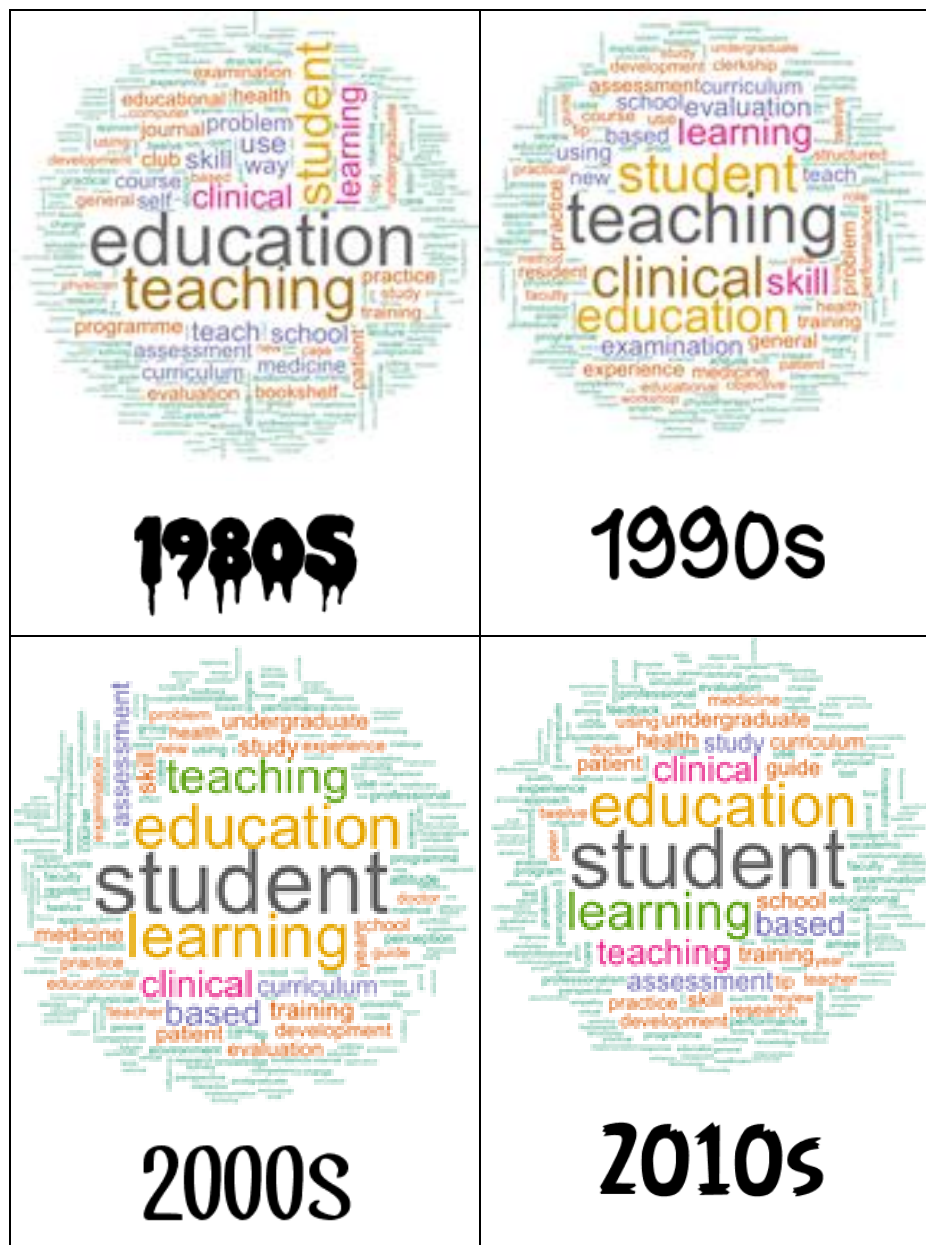
The use of the colon grew linearly from 0 in 1966, peaking in 1993 (53%), dropping back to 34% in 2000, then climbing again (49% in 2015) (Table 2). Colons are used to add supplementary information to the title but can make titles long and cumbersome¹⁴. Titles with question marks have grown from 0 in 1966 to 13% in 2015, with a fitted logistic growth model predicting use will saturate around 15% (figure 1). The exclamation mark did not appear till 2000 with the title *“If you want the surgery done well, get a woman to do it!”*¹⁵, perhaps recognising its provocative nature. They have since been sporadic, and are not used extensively. Emoticons had not appeared at time of writing.

| Decade | Number | : | % | ? | % | ! | % |
|---------|--------|------|-----|-----|-------|----|------|
| 60s | 183 | 20 | 11% | 2 | 1.1% | 0 | 0.0% |
| 70s | 586 | 105 | 18% | 16 | 2.7% | 0 | 0.0% |
| 80s | 711 | 204 | 29% | 34 | 4.8% | 0 | 0.0% |
| 90s | 959 | 421 | 44% | 79 | 8.2% | 0 | 0.0% |
| 2000s | 2548 | 975 | 38% | 280 | 11.0% | 14 | 0.5% |
| 2010s | 1371 | 589 | 43% | 162 | 11.8% | 4 | 0.3% |
| Overall | 6357 | 2314 | 36% | 573 | 9.0% | 18 | 0.3% |

Trends in words

Analysis of the journal *Medical Teacher* revealed similar trends (visualised in Figure 2), in particular the shift from ‘teaching’ to ‘learning’. However, there are some striking differences. Whereas ‘student’ was the most frequent word in *Medical Education* titles throughout, it appeared less than ‘education’ and ‘teaching’ in the 80s and ‘teaching’ in the 90s in *Medical Teacher*. All word clouds for both journals showed much more use of the term ‘teaching’ than ‘training’.

[illegible]



Limitations and Conclusions

This paper did not look at the impact of any of the trends observed on metrics of the titles' effectiveness (e.g., conversion rates from reading the abstract to reading the paper). Nor were we able to examine editorial guideline changes, thereby preventing us from determining which trends were driven by journal policies and which were driven by changes in the culture of the field. Nonetheless, we were able to observe and illustrate intriguing and shifting trends in medical education title-writing over the last 50 years. There has been a clear move from emphasis on teaching to learning, indicating a shift from teacher- to learner-centred education. The arrival of

online searching and Twitter may be a driver of change in style. The use of humour, particularly coupled with changes in how readers select papers warrants further study, as does the movement in individual words being used.

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